

## Measuring and maximising water use efficiency

By Andrew Murray, Aquatech Consulting, Narrabri

**M**aximising productivity per megalitre is the key element in maintaining profitable irrigation systems. The irrigation industry is by far the biggest user of water in Australia (70–80 per cent). The political reality is that the industry must prove that it is using water productively.

The cotton industry has always been an efficient water user because of the chronic lack of water. In recent years it has again shown leadership with the adoption of the Irrimate technology to measure and better manage scarce irrigation water. The real bonus for the grower is that better management of the water has meant more production, increased yields, and more profit.

A CRDC funded study in 2000 by the National Centre for Engineering in Agriculture found that key losses on a typical cotton farm are:

- Storage losses (20–45 per cent);

- In-field irrigation losses (15–30 per cent); and,
- Distribution losses (10–15 per cent).

Work by Aquatech Consulting in Narrabri as part of a Cotton CRC project using WaterTrack confirm these results.

### Improving in-field water use efficiency

Large water savings are possible by making simple changes to traditional irrigation practice. Siphon flow rates and irrigation set times should be changed to suit the soil, field length, and slope — not labour convenience. By fine tuning irrigation practices, an average water saving of 0.20 ML per hectare per irrigation has been achieved.

### Measuring and managing storage losses

Many farmers who have measured their storage losses using the Irrimate Seepage and Evaporation meter have

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been surprised by the results. Seepage rates range from 0.7 mm per day to 33 mm per day (this range was actually measured in storages just seven km apart). Seepage rates in excess of five mm per day are considered a problem and options for repair should be considered. Seepage rates can vary significantly due to prior streams or isolated pockets of sandy soils.

Quantifying seepage and evaporation losses allows an assessment of possible changes in farm management such as reducing the use of a storage. This data can also be used to assess the value of infrastructure changes, or examine technologies such as polyacrylamides and monolayer applications.

### How much water do I have left in my storage?

In order to conduct a water budget it is important to know the volume of water that is held in storages. In the past, gauge boards have provided us with this information. The Irrimate Storage Meter provides an electronic alternative to the gauge board with the added features of logging storage volume, surface, and water depth every 30 minutes. A continuous record of storage volumes is valuable information and also allows rates of inflow and outflow to be measured without the need for pipe flowmeters.

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